



Air Traffic Management (ATM) Test Bed

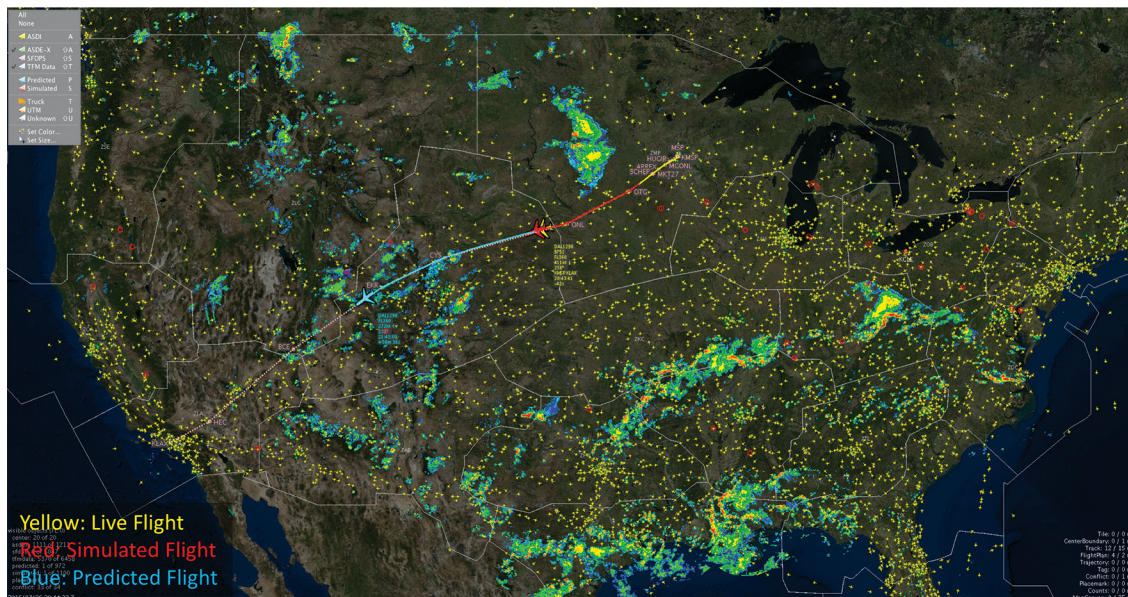
The Air Traffic Management (ATM) Test Bed is an inter-connected air traffic simulation test capability being developed by NASA to help accelerate the introduction of advanced technologies in the National Airspace System (NAS). The Test Bed will be used by the nation's ATM community, consisting of government, industry, and academic research and development experts. The ATM Test Bed's core purpose is to enable realistic simulations of current and proposed future air traffic concepts for the nation's Next Generation Air Transportation System (NextGen) and beyond. The principal concepts to be simulated include origin-to-destination, trajectory-based operations, widespread integration of novel vehicles and operations such as unmanned vehicles, and real-time safety assurance technologies to enable autonomous operations.

The ATM community is developing new concepts and technologies to address the needs of the NextGen Air Transportation System to increase the capacity of airspace, reduce delays, and reduce the cost of ATM operations. However, the introduction of these advances into the NAS is currently gradual and evolutionary, and targets

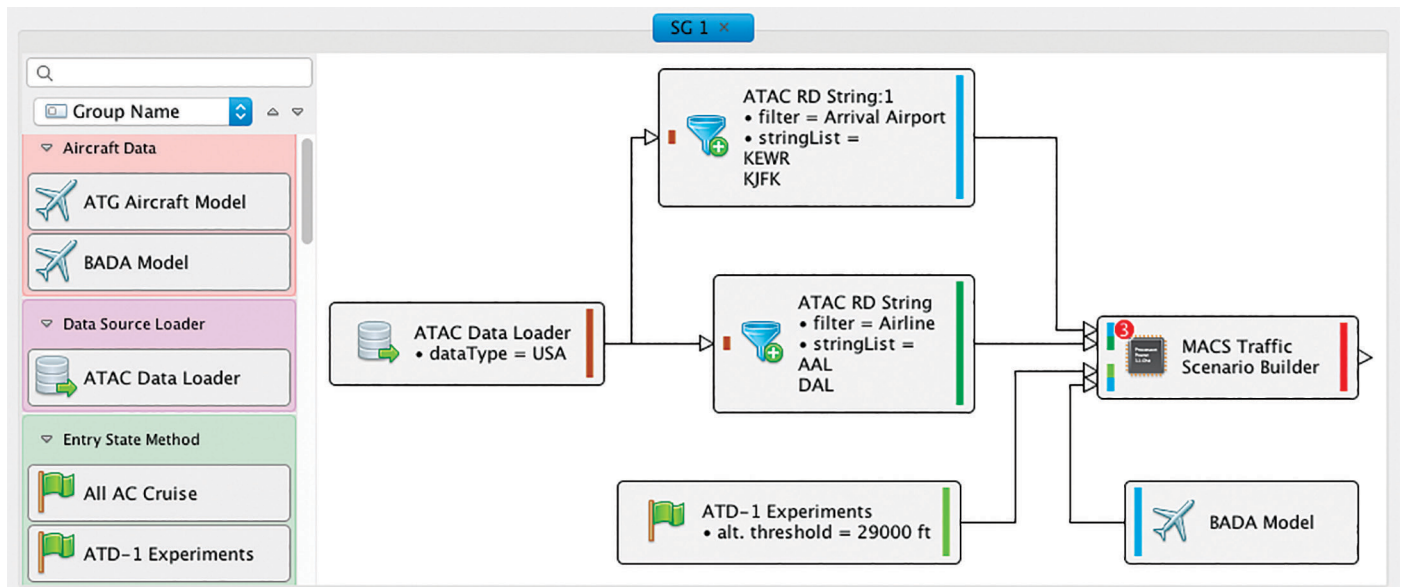
limited parts of the airspace in order to reduce risk in integration and transition with the existing system. Using the ATM Test Bed, NASA aims to accelerate the NAS transformation by enabling the sophisticated simulation and evaluation of multiple, integrated technologies, testing NAS-wide operational solutions. This approach helps to convincingly demonstrate potential benefits and concept feasibility.

Current simulation evaluation is laborious and limited. Researchers and developers create limited air traffic scenarios based on actual NAS operations with difficulty reproducing the same conditions when testing competing concepts. The ATM Test Bed enables the rapid, repeatable creation of sophisticated, end-to-end transportation conditions, and enabling the mixture of live and virtual simulation assets in the evaluation. For example, while a real aircraft flies, a simulated flight could be created to evaluate the performance of the simulated flight and the interaction between the test vehicles. The ATM Test Bed provides the "what-if" capability for air traffic management and operator decision support based on comprehensive real-time data feeds.

NASAfacts



This screenshot shows an example of a shadow-mode simulation of a flight for its comparison with a live flight. The image shows a path and location of a live flight, a simulated flight location, and a predicted location for the flight an hour into the future.



The ATM Test Bed features a web-accessible drag-and-drop graphical tool for designing a simulation from existing or new plug-and-play blocks representing shareable community technologies and tools.

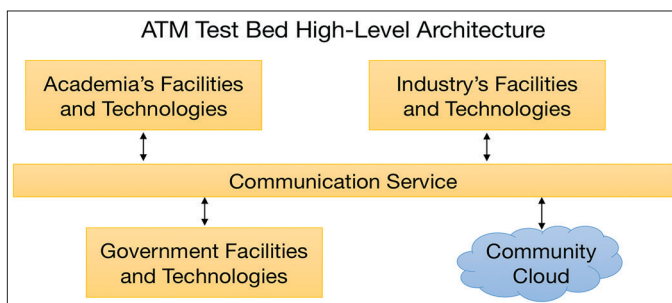


This image represents a potential simulation using the ATM Test Bed that enables sharing of technologies and tools from various facilities and users.

Highlights of the ATM Test Bed:

- Reduces the time to test concepts, technologies, and their interactions, interoperability, and integration by providing shared operational historical or live data, operational tools, remote access, and the community's existing simulation tools
- Improves understanding of interactions among various concepts, algorithms, human-automation and air-ground architectures, and technologies to identify benefits and feasibility at the NAS level
- Enables assessment of large-scale contingency operation alternatives using shadow-mode simulation
- Enables uncertainty assessment

For more information on the Air Traffic Management (ATM) Test Bed, please visit www.aviationsystems.arc.nasa.gov.



The Test Bed enables a standardized communication service for distributed plug-and-play ATM community technologies to allow sharing of tools and collaborative simulations.

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